

Cincinnati in honor of a society of Revolutionary War heroes named after Cincinnatus, an ancient Roman general. Hot Springs, New Mexico, was renamed Truth or Consequences in 1950 in honor of a long-running radio and television program of that name. The name was changed by an overwhelmingly favorable vote of the town residents in order to promote publicity for the economically struggling town.

Names can also change as a result of political upheavals. For example, following World War II, Poland gained control over territory that was formerly part of Germany and changed many of the place names from German to Polish. Among the larger cities, Danzig became Gdansk, Breslau became Wrocław, and Stettin became Szczecin.

After the fall of communism in the early 1990s, names throughout Eastern Europe were changed, in many cases reverting to those used before the Communists had gained power a few decades earlier. For example, after the demise of communism:

- Gottwaldov, Czechoslovakia, named for a Communist president of the country, reverted to its former name, Zlín, in the Czech Republic.
- Leningrad, the second-largest city in the Soviet Union, reverted to St. Petersburg, Russia.
- Karl-Marx-Stadt in East Germany reverted to Chemnitz in a reunified Germany.

What may be the longest community name in the world has an economic origin—the Welsh town of Llanfairpwllgwyngyllgogerychwyrndrobwllllantysiliogogoch. The 58-letter name means “the Church of St. Mary’s in the grove of the white hazelnut tree near the rapid whirlpool and the Church of St. Tisilio near the red cave.” The town’s name originally encompassed only the first 20 letters (Llanfairpwllgwyngyll), but when the railway was built in the nineteenth century, the townspeople lengthened it. They decided that signs with the longer name in the railway station would attract attention and bring more business and visitors to the town. The longest place name in the United States, at a mere 45 letters, may be Lake Chargoggagoggmanchauggagoggchaubunagungamaugg, in central Massachusetts.

## Site

The second way that geographers describe the location of a place is by site, which is the physical character of a place. Important site characteristics include climate, water sources, topography, soil, vegetation, latitude, and elevation. The combination of physical features gives each place a distinctive character.

Site factors have always been essential in selecting locations for settlements, although people have disagreed on the attributes of a good site, depending on cultural values. Some have preferred a hilltop site for easy defense from attack. Others located settlements near convenient river-crossing points to facilitate communication with people in other places.

An island combines the attributes of both hilltop and river-side locations, because the site provides good defense and

transportation links. The site of the country of Singapore, for example, is a small, swampy island approximately 1 kilometer off the southern tip of the Malay Peninsula at the eastern end of the Strait of Malacca. The city of Singapore covers nearly 20 percent of the island.

Humans have the ability to modify the characteristics of a site. The southern portion of New York City’s Manhattan Island is twice as large today as it was in 1626, when Peter Minuit bought the island from its native inhabitants for the equivalent of \$23.75 worth of Dutch gold and silver coins. The additional land area was created by filling in portions of the East River and Hudson River. In the eighteenth century, landfills were created by sinking old ships and dumping refuse on top of them.

Because of poor health conditions, the city decided in 1797 to cover all the landfills with soil and gravel and to lay out a new street, called South Street, to halt further dumping in the river. Today South Street is two blocks from the river. More recently, New York City permitted construction of Battery Park City, a 57-hectare (142-acre) site designed to house more than 20,000 residents and 30,000 office workers (Figure 1-6). The central areas of Boston and Tokyo have also been expanded through centuries of landfilling in nearby bays, substantially changing these sites.

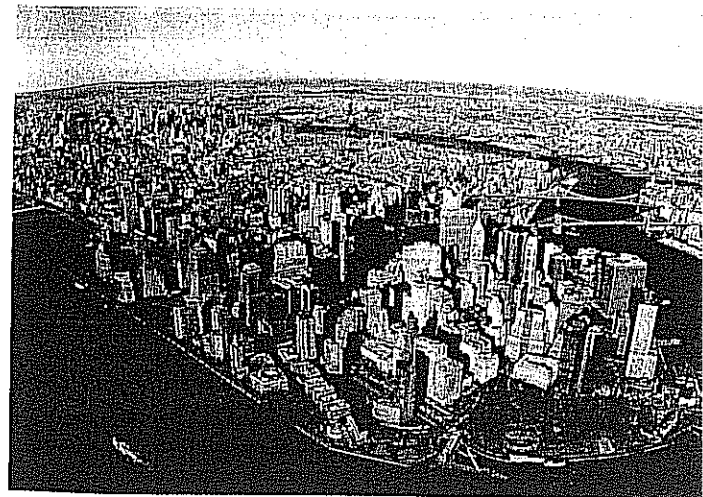
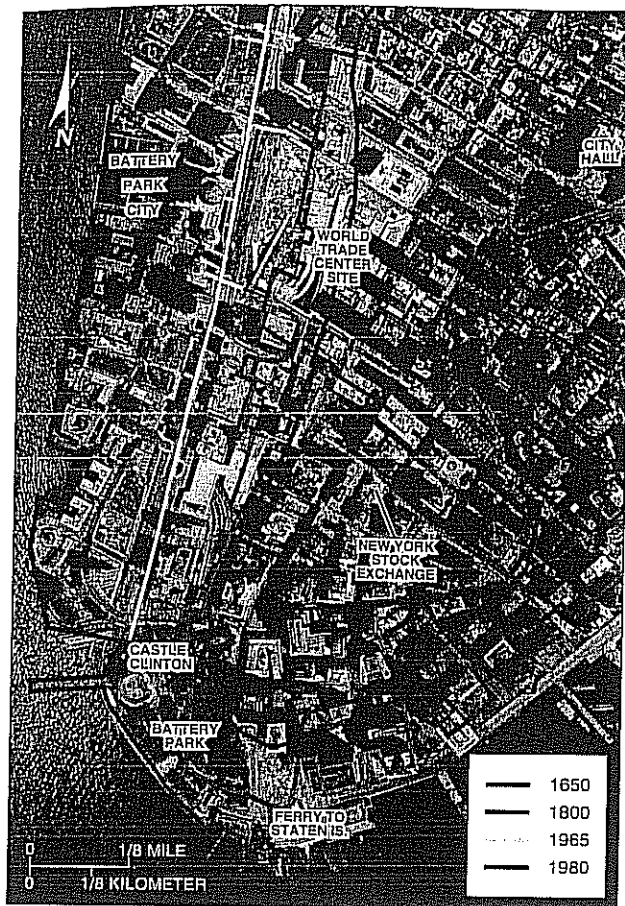
A portion of the Battery Park City site was created from landfill excavated immediately to the east during the 1960s to construct the World Trade Center. The Battery Park City site was built by placing in the Hudson River a series of watertight enclosures known as cofferdams, which were made of steel and filled with sand. Water was pumped from inside the enclosure to expose the riverbed, and the enclosure was filled with 1 million cubic meters of dirt from the World Trade Center site. Excavating the landfill from the World Trade Center site unearthed a large number of maritime objects, such as anchors, because as Figure 1-6 shows, the site was underwater in the seventeenth century.

## Situation

Situation is the location of a place relative to other places. Situation is a valuable way to indicate location for two reasons—finding an unfamiliar place and understanding its importance.

First, situation helps us find an unfamiliar place by comparing its location with a familiar one. We give directions to people by referring to the situation of a place: “It’s down past the courthouse, on Locust Street, after the third traffic light, beside the yellow-brick bank.” We identify important buildings, streets, and other landmarks to direct people to the desired location.

For example, even longtime residents of Paris might have difficulty finding the Marmottan Museum by its address, 2 rue Louis-Boilly, because the street is only one block long. The museum, which contains the world’s largest collection of paintings by Claude Monet, can be found by referring to its situation: one block east of the Bois de Boulogne (the city’s largest park), near the Muette stop on the Métro (subway).



**FIGURE 1-6** Site of New York City. Much of the southern part of New York City's Manhattan Island was built on landfill. Several times in the past 200 years the waterfront has been extended into the Hudson and East rivers to provide more land for offices, homes, parks, warehouses, and docks. The World Trade Center was built during the late 1960s and early 1970s partially on landfill in the Hudson River from the colonial era. Battery Park City (at left in the photograph) was built on landfill removed from the World Trade Center construction site.

Second, situation helps us understand the importance of a location. Many locations are important because they are accessible to other places. For example, because of its location, Singapore has become a center for the trading and distribution of goods for much of Southeast Asia. Singapore is situated near the Strait of Malacca, which is the major passageway for ships traveling between the South China Sea and the Indian Ocean (Figure 1-7). Some 50,000 vessels, one-fourth of the world's maritime trade, pass through the strait each year.

## Mathematical Location

The location of any place on Earth's surface can be described precisely by meridians and parallels, two sets of imaginary arcs drawn in a grid pattern on Earth's surface. A meridian is an arc drawn between the North and South poles. A parallel is a circle drawn around the globe parallel to the equator and at right angles to the meridians.

The location of each meridian is identified on Earth's surface according to a numbering system known as longitude (Figure 1-8). The meridian that passes through the Royal Observatory at Greenwich, England, is  $0^\circ$  longitude, also called the prime meridian. The meridian on the opposite side of the globe from the prime meridian is  $180^\circ$  longitude. All other meridians have numbers between  $0^\circ$  and  $180^\circ$  east or west, depending if they are either east or west of the prime meridian. For example, New York City is located at  $74^\circ$  west longitude,

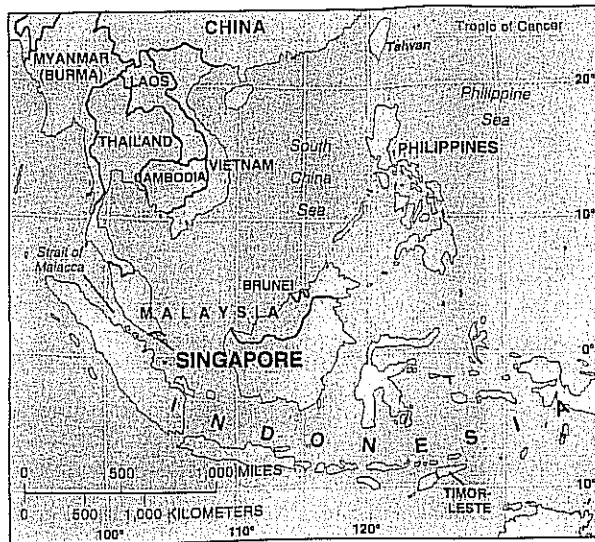
and Lahore, Pakistan, at  $74^\circ$  east longitude. San Diego is located at  $117^\circ$  west longitude, and Tianjin, China, at  $117^\circ$  east longitude.

Longitude plays an important role in calculating time. Earth makes a complete rotation every 24 hours and as the sphere is divided into  $360^\circ$  of longitude. Therefore, traveling  $15^\circ$  east or west is the equivalent of traveling to a place that is 1 hour earlier or later than the starting point ( $360^\circ$  divided by 24 hours equals  $15^\circ$ ).

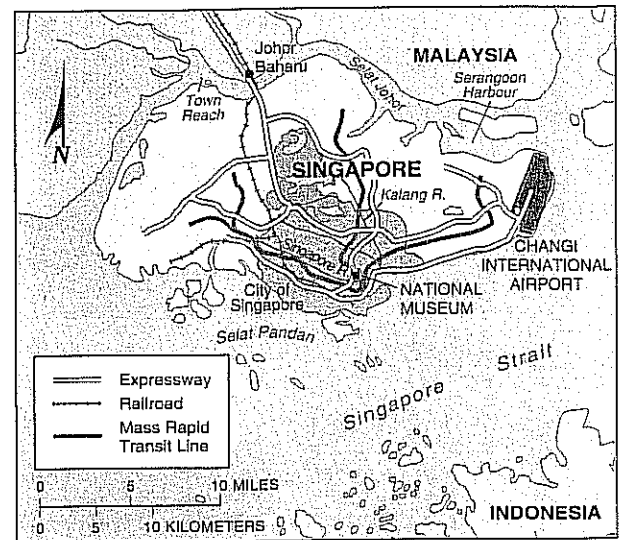
The numbering system to indicate the location of a parallel is called latitude. The equator is  $0^\circ$  latitude, the North Pole  $90^\circ$  north latitude, and the South Pole  $90^\circ$  south latitude. New York City is located at  $41^\circ$  north latitude, and Wellington, New Zealand, at  $41^\circ$  south latitude. San Diego is located at  $33^\circ$  north latitude, and Santiago, Chile, at  $33^\circ$  south latitude. Latitude and longitude are used together to identify locations. For example, Midland, Texas, is located at  $32^\circ$  north latitude and  $102^\circ$  west longitude.

The mathematical location of a place can be designated more precisely by dividing each degree into 60 minutes (') and each minute into 60 seconds ("). For example, the official mathematical location of Denver, Colorado, is  $39^\circ 44'$  north latitude and  $104^\circ 59'$  west longitude. The state capitol building in Denver is located at  $39^\circ 42' 52''$  north latitude and  $104^\circ 59' 04''$  west longitude.

GPS systems typically divide degrees into decimal fractions rather than minutes and seconds. Toyota's factory in Georgetown, Kentucky, for example is located at  $38.233407^\circ$  north latitude and  $84.550239^\circ$  west longitude.



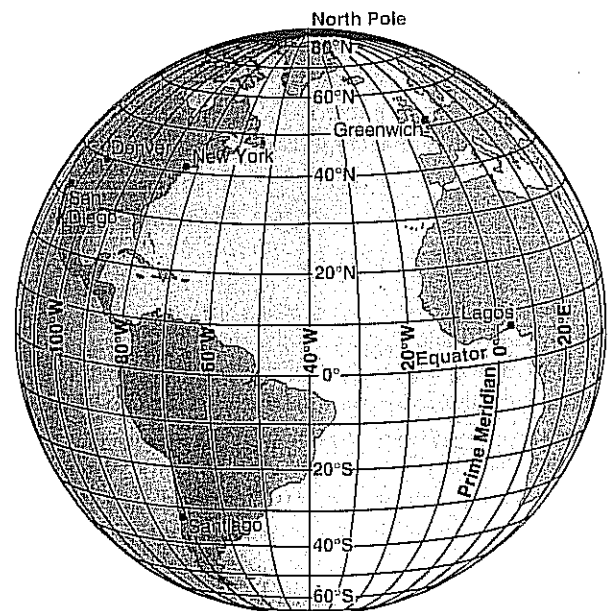
**FIGURE 1-7** Situation of Singapore. The small country of Singapore, less than one-fifth the size of Rhode Island, has an important situation for international trade. The country is situated at the confluence of several straits that serve as major passageways for shipping between the South China Sea and the Indian Ocean. Downtown Singapore is situated near where the Singapore River flows into the Singapore Strait.



**DETERMINING LONGITUDE.** Measuring latitude and longitude is a good example of how geography is partly a natural science and partly a study of human behavior. Latitudes are scientifically derived by Earth's shape and its rotation around the Sun. The equator ( $0^\circ$  latitude) is the parallel with the largest circumference and is the place where every day has 12 hours of daylight. Even in ancient times, latitude could be accurately measured by the length of daylight and the position of the Sun and stars.

On the other hand,  $0^\circ$  longitude is a human creation. Any meridian could have been selected as  $0^\circ$  longitude, because all have the same length and all run between the poles. The  $0^\circ$  longitude runs through Greenwich because England was the world's most powerful country when longitude was first accurately measured and the international agreement was made.

Inability to measure longitude was the greatest obstacle to exploration and discovery for many centuries. Ships ran aground or were lost at sea because no one on board could pinpoint longitude. The British Parliament enacted the Longitude Act of 1714, which offered a prize equivalent to several million dollars today to the person who could first measure longitude accurately. English clockmaker John Harrison won the prize by inventing the first portable clock that could keep accurate time on a ship, because it did not have a pendulum.



**FIGURE 1-8** Geographic grid. Meridians are arcs that connect the North and South poles. The meridian through Greenwich, England, is the prime meridian or  $0^\circ$  longitude. Parallels are circles drawn around the globe parallel to the equator. The equator is  $0^\circ$  latitude, and the North Pole is  $90^\circ$  north latitude.

When the Sun was directly overhead of the ship—noon local time—Harrison's portable clock set to Greenwich time could be examined. If the clock said it was 2 P.M. in Greenwich, for example, then the ship was at 30° west longitude, because each hour of difference was equivalent to traveling 15° longitude. Most eighteenth-century scientists were convinced that longitude could be determined only by the position of the stars, so Harrison was not actually awarded the prize until 40 years after his invention.

**TELLING TIME FROM LONGITUDE.** Longitude plays an important role in calculating time. Earth as a sphere is divided into 360° of longitude (the degrees from 0° to 180° west longitude, plus the degrees from 0° to 180° east longitude). As Earth rotates daily, these 360 imaginary lines of longitude pass beneath the cascading sunshine. If we let every fifteenth degree of longitude represent one time zone, and divide the 360° by 15°, we get 24 time zones, or one for each hour of the day.

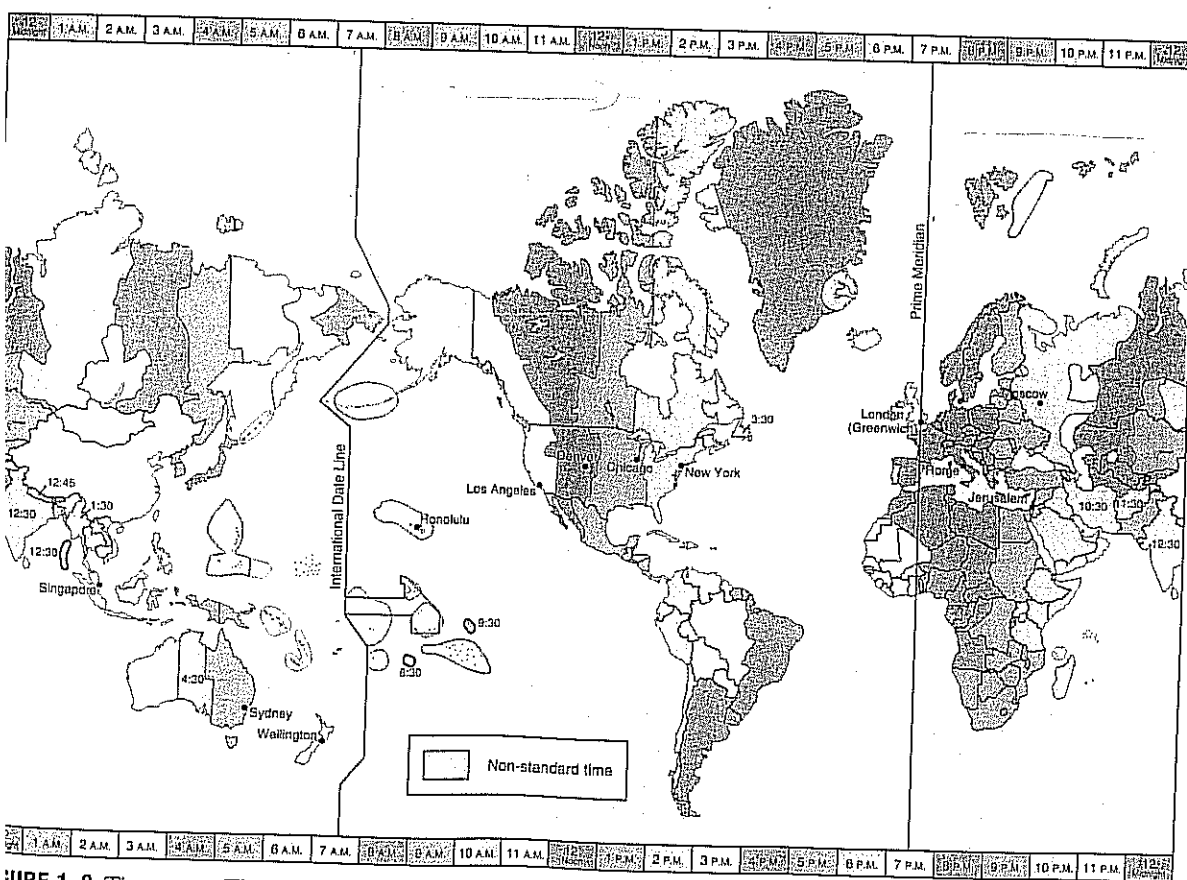
The international agreement designated the time at the prime meridian (0° longitude) as Greenwich Mean Time (GMT) or Universal Time (UT). It is the master reference time for all points on Earth. As Earth rotates eastward, any place to the east of you always passes "under" the Sun earlier. Thus as you travel eastward from the prime meridian, you are

"catching up" with the Sun, so you must turn your clock ahead from GMT by 1 hour for each 15°. If you travel westward from the prime meridian, you are "falling behind" the Sun, so you turn your clock back from GMT by 1 hour for each 15°.

The eastern United States, which is near 75° west longitude, is therefore 5 hours earlier than GMT (the 75° difference between the prime meridian and 75° west longitude, divided by 15° per hour, equals 5 hours). Thus when the time is 11 A.M. GMT, the time in the eastern United States is 5 hours earlier, or 6 A.M. (Figure 1-9).

Each 15° band of longitude is assigned to a standard time zone. The 48 contiguous U.S. States and Canada share four standard time zones, known as Eastern, Central, Mountain, and Pacific:

- The Eastern Standard Time Zone is near 75° west longitude, which passes close to Philadelphia, and is 5 hours earlier than GMT.
- The Central Standard Time Zone is near 90° west longitude, which passes through Memphis, Tennessee, and is 6 hours earlier than GMT.
- The Mountain Standard Time Zone is near 105° west longitude, which passes through Denver, Colorado, and is 7 hours earlier than GMT.



**FIGURE 1-9** Time zones. The world is divided into 24 standard time zones, each of which represents 15° of longitude. Greenwich Mean Time (GMT) is the time near the prime meridian, or 0° longitude. The Pacific Time Zone, which encompasses the western part of the United States and Canada, is 8 hours behind GMT because it is situated near 120° west longitude.